

SOUTHERN RESIDENT KILLER WHALE SYMPOSIUM
APRIL 3-5, 2006
NOAA WESTERN REGIONAL CENTER AUDITORIUM
7600 SANDPOINT WAY NE
SEATTLE, WASHINGTON

PROPOSED AGENDA

SYMPOSIUM OBJECTIVES

1. Present new research results;
2. Examine how this information moves us forward in informing conservation actions; and
3. Discuss what additional research, if any, is needed.

MONDAY, APRIL 3

- 1:00 – 1:20 Welcome, Introductions, and Agenda Review
- Welcome and opening comments – *Linda Jones, Northwest Fisheries Science Center (NWFSC)*
 - Opening comments – *Usha Varanasi, NWFSC Science Director*
 - Introductions, agenda review, and ground rules – *Paul De Morgan, RESOLVE*
- 1:20 – 2:35 Management Needs
- NOAA Fisheries, NW Regional Office – Regulatory status of SRKWs and science needs to conserve them – *Garth Griffin*
 - Washington Department of Fish and Wildlife – *Rocky Beach*
 - Fisheries and Oceans Canada – Recovery planning and research needs – *Marilyn Joyce*
- 2:35 – 2:55 Review of High Priority Research Questions from Previous Workshops
- Overview – *Mike Ford, NWFSC*
 - Question and answer

GENETICS SESSION

High Priority Research Questions:

- *Are the North Pacific resident killer whales a distinct species or subspecies?*
- *What are the patterns of mating within the Southern Residents, and between the Southern Residents and other eastern North Pacific killer whale populations? Are intrinsic demographic problems, such as a lack of appropriate mates or inbreeding depression, limiting the Southern Resident's recovery?*

- *What was the historical size of the Southern Resident killer whale population? Is there genetic evidence that the Southern Resident's have experienced a severe genetic bottleneck?*

2:55 – 3:15 Genetics Presentations (Session Leader: Mike Ford)

- Mike Ford, NWFSC – Killer whale taxonomy and “species” status under the Endangered Species Act

3:15 – 3:30 BREAK

3:30 – 4:20 Genetics Presentations (cont.)

- Phil Morin, Southwest Fisheries Science Center – Genetic analysis of killer whale (*Orcinus orca*) historical bone and tooth samples to identify western U.S. ecotypes
- Phil Morin, Southwest Fisheries Science Center – On the use of AFLP markers for taxonomic study of killer whales (R. LeDuc, N. Hedrick, and R. Pitman)
- Rus Hoelzel, University of Durham – Evolution of population genetic structure of killer whales (*Orcinus orca*) in the North Pacific

4:20 – 4:50 Genetics Discussion

1. What are the significant results in terms of answering the high priority research question(s) or in better understanding the population and its conservation?
2. How can these results be used to inform the conservation of the Southern Resident killer whales?
3. Are there critical information gaps that still need to be addressed for conservation? If so, what are they? What method(s) is most likely to successfully address the gap taking into account biases and cost and logistical limitations?

POPULATION DYNAMICS SESSION

High Priority Research Questions:

- *What is the population growth rate of Southern Residents and what causes variation in the rate from that of Northern Residents?*
- *What factors are affecting the reproductive success of SRKWs?*
- *What are the factors affecting mortality?*
- *Do changes in the social structure affect the population's ability to recover?*

4:50 – 5:30 Population Dynamics Presentations (Session Leader: Eli Holmes)

- Eli Holmes, NWFSC – Southern Resident killer whale population dynamics and population viability analysis (P.R. Wade and K.C. Balcomb III)

- Peter Olesiuk, Fisheries and Oceans Canada – Life history and population dynamics of resident killer whales (*Orcinus orca*) in British Columbia and neighbouring waters

5:30 ADJOURN FOR THE DAY

**6:30 – 8:30 EVENING RECEPTION: WATERTOWN HOTEL
4242 ROOSEVELT WAY, NE**

All Symposium participants are invited to attend an evening reception at the Watertown Hotel from 6:30 p.m. to 8:30 p.m. Dr. Usha Varanasi, Northwest Fisheries Science Center Science Director, will welcome everyone and offer opening comments.

TUESDAY, APRIL 4

8:00 – 8:30 COFFEE AVAILABLE

POPULATION DYNAMICS SESSION (CONT.)

8:30 – 8:45 Population Dynamics Presentations (cont.)

- Ken Balcomb, Center for Whale Research – Long-term social dynamics of fish-eating killer whales (K.M.Parsons; K.C. Balcomb; J.W. Durban; J. K.B.Ford)

8:45 – 9:05 Population Dynamics Discussion

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CONTAMINANTS SESSION

High Priority Research Questions:

- *What are the differences in levels and patterns of contaminants among the Southern Resident pods, as well as differences between Southern Residents and other eastern North Pacific killer whale populations?*
- *Is there a relationship between exposure to contaminants in Southern Resident whales and their survivorship or reproductive success?*

9:05 – 9:55 Contaminants Presentations (Session Leader: Peggy Krahn)

- Peter Ross, Fisheries and Oceans Canada – Persistent organic pollutants in marine mammals inhabiting the transboundary waters of British Columbia-Washington
- Gina Ylitalo, NWFSC and Sandie O'Neill, WDFW – Regional patterns of persistent organic pollutants in five Pacific salmon species (*Oncorhynchus* spp) and their contributions to contaminant levels in northern and Southern Resident killer whales (*Orcinus orca*)

9:55 – 10:15 Contaminants Discussion

1. What are the significant results in terms of answering the high priority research question(s) or in better understanding the population and its conservation?
2. How can these results be used to inform the conservation of the Southern Resident killer whales?

3. Are there critical information gaps that still need to be addressed for conservation? If so, what are they? What method(s) is most likely to successfully address the gap taking into account biases and cost and logistical limitations?

10:15 – 10:30 BREAK

PREY SESSION

High Priority Research Questions:

- *What are the important prey species for SRKWs?*
- *Is prey abundance adequate to support SRKW populations?*
- *Is the quality of the prey adequate to meet the nutritional and energetic needs of killer whales?*

10:30 – 12:05 Prey Presentations (Session Leader: John Ford)

- John Ford, Fisheries and Oceans Canada – Selective foraging in resident killer whales
- Shannon McClusky, University of Washington – Movement patterns and population trends of Southern Resident killer whales in relation to relative abundance and distribution of Pacific Salmon in the Puget Sound – Georgia Basin
- Peggy Krahn, NWFSC – Feeding ecology of eastern North Pacific killer whales *Orcinus orca* from fatty acid, stable isotope and organochlorine analyses of blubber biopsies
- Brad Hanson, NWFSC – Investigations of associations of southern resident killer whales and their prey
- Jeff Haymes, WDFW – Washington Chinook Salmon abundance (B.Sanford)
- John Ford, Fisheries and Oceans Canada – Linking prey and population dynamics: did food limitation cause recent declines of resident killer whales?

12:05 – 12:35 Prey Discussion

1. What are the significant results in terms of answering the high priority research question(s) or in better understanding the population and its conservation?
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3. Are there critical information gaps that still need to be addressed for conservation? If so, what are they? What method(s) is most likely to successfully address the gap taking into account biases and cost and logistical limitations?

12:35 – 1:50 LUNCH

ENERGETICS SESSION

High Priority Research Question:

- *Is the quality of the prey adequate to meet the nutritional and energetic needs of killer whales?*

1:50 – 2:20 Energetics Presentations (Session Leader: Dawn Noren)

- Robin Dunkin, University of California, Santa Cruz – Seasonal variation in energetic status and body condition in killer whales (T.M. Williams)
- Samuel Wasser, University of Washington – Non-invasive monitoring of physiological health of Southern Resident killer whales

2:20 – 2:35 Energetics Discussion

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DISTRIBUTION AND HABITAT SESSION

High Priority Research Questions:

- *What habitats are important for Southern Resident killer whales, particularly in outer coastal waters?*

2:35 – 4:00 Distribution and Habitat (Session Leader: Brad Hanson)

- Ken Balcomb, Center for Whale Research – Winter distribution of Southern Resident killer whales, 2003-2006
- Jeff Nystuen, Applied Physics Laboratory, University of Washington – Listening for orcas in the underwater racket of Cape Flattery and Haro Strait
- John Hildebrand, Scripps Institution of Oceanography, University of California, San Diego – Killer whale acoustic monitoring in the Coastal Waters of Washington
- Rich Osborne, The Whale Museum – Puget Sound distribution of Southern Resident killer whales
- Donna Hauser, University of Washington – Effects of environmental factors and temporal scale on pod-specific Southern Resident killer whale summer distribution patterns: implications for designating critical habitat

4:00 – 4:15 BREAK

4:15 – 4:45 Distribution and Habitat Discussion

1. What are the significant results in terms of answering the high priority research question(s) or in better understanding the population and its conservation?
2. How can these results be used to inform the conservation of the Southern Resident killer whales?
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VESSEL INTERACTIONS SESSION

High Priority Research Question:

- *Does vessel presence affect Southern Resident killer whales?*

4:45 – 5:45 Vessel Interactions Presentations (Session Leader: Dawn Noren)

- Dave Bain, University of Washington – Land-based studies of the effects of vessel traffic on the behavior of Northern and Southern Resident killer whales (*Orcinus* spp.)
- Dawn Noren, NWFSC – Behavioral energetics of Southern Resident killer whales
- Jennifer Marsh, University of Washington – Social behavior of Southern Resident killer whales (*Orcinus orca*)

5:45 ADJOURN FOR THE DAY

WEDNESDAY, APRIL 5

8:00 – 8:30 COFFEE AVAILABLE

VESSEL INTERACTIONS SESSION (CONT.)

8:30 – 9:00 Vessel Interactions Discussion

1. What are the significant results in terms of answering the high priority research question(s) or in better understanding the population and its conservation?
2. How can these results be used to inform the conservation of the Southern Resident killer whales?
3. Are there critical information gaps that still need to be addressed for conservation? If so, what are they? What method(s) is most likely to successfully address the gap taking into account biases and cost and logistical limitations?

NOISE EFFECTS SESSION

High Priority Research Question:

- *Does vessel noise adversely affect Southern Resident killer whales?*

9:00 – 10:35 Noise Effects Presentations (Session Leader: Brandon Southall)

- Brandon Southall, Office of Science and Technology, NMFS – Acoustic creatures in noisy environments: effects of sound on marine wildlife
- John Hildebrand, Scripps Institution of Oceanography, University of California, San Diego – Ambient noise in the Haro Strait from whale watching and commercial vessels
- Val Veirs, Colorado State – Average levels and power spectra of ambient sound in the habitat of Southern Resident orcas
- Mike Wolfson, Applied Physics Laboratory, University of Washington – The acoustic environment of Haro Strait: A data-model comparison of shipping traffic noise (Chris Jones)
- Andrew Foote, University of Durham – Acoustic studies of the Southern Resident killer whale population: implications for remote acoustic monitoring and indications of vocal behavioral change due to vessel noise

10:35 – 10:50 BREAK

10:50 – 11:20 Noise Effects Discussion

1. What are the significant results in terms of answering the high priority research question(s) or in better understanding the population and its conservation?

2. How can these results be used to inform the conservation of the Southern Resident killer whales?
3. Are there critical information gaps that still need to be addressed for conservation? If so, what are they? What method(s) is most likely to successfully address the gap taking into account biases and cost and logistical limitations?

INVITED PANEL ROUNDTABLE

The following individuals will be reflecting on the Symposium presentations and discussions and offering their insights and views on related questions:

- Ken Balcomb, Center for Whale Research
- John Durban, Alaska Fisheries Science Center
- John Ford, Fisheries and Oceans Canada
- Brandon Southall, Office of Science and Technology, NMFS
- Laurie Weitkamp, NWFSC
- Judy Zeh, University of Washington

11:20 – 12:30 Invited Panel Roundtable and Open Discussion – Session I

- After assessing all the information, what are the significant results in terms of answering the high priority research question(s) or in better understanding the population and its conservation?
- Can the risk factors that have been identified be ranked in terms of their impacts to the population?
- What are the potential interactions between risks factors?
- How can these results be used to inform the conservation of the Southern Resident killer whales?

12:30 – 1:45 LUNCH

1:45 – 2:45 Open Discussion – Session I (continued)

2:45 – 3:30 Invited Panel Roundtable and Open Discussion – Session II

- What are the highest priorities for future research?
- Are there critical information gaps that still need to be addressed for conservation? If so, what are they? What method(s) is most likely to successfully address the gap taking into account biases and cost and logistical limitations?

3:30 – 3:45 BREAK

3:45 – 4:30 Open Discussion – Session II (continued)

4:30 – 4:45 Next Steps and Acknowledgments

4:45 ADJOURN